

CFC alternative is free
for the asking

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Single-board computers
sing commodity blues

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Capital spending to
rise slightly in '92

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Electronic Business[®]

A CAHNERS PUBLICATION

FOR THE MANAGEMENT TEAM IN ELECTRONICS, COMPUTER AND SYSTEMS COMPANIES WORLDWIDE

FEBRUARY 24, 1992



INTELLECTUAL
PROPERTY
REPORT

PROTECTING
THE
POWER
OF THE
IDEA

PAGE 24

Electronic Business

VOLUME 18 NUMBER 4

FOR THE MANAGEMENT TEAM IN ELECTRONICS, COMPUTER, AND SYSTEMS COMPANIES—WORLDWIDE

FEBRUARY 24, 1992



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As the industry moves from the age of manufacturing to the age of intellectual property, companies remain dangerously exposed to rip-offs. Are your assets covered?

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Why is a Japanese patent different from a U.S. patent? Can a single patent protect you in 15 European nations? Here's an intellectual-property guide for the non-expert

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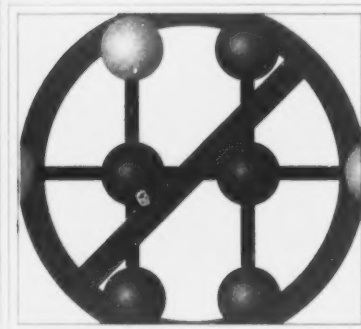
Board vendors caught by the collapse of personal computer prices are touting their latest attractions—RISC chips, software, and services.



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Total Circulation: 77,804

REPRINTS

ELECTRONIC BUSINESS articles are available on a custom printing basis at reasonable prices.
 Contact Andrea Marwitz, Cahners Reprint Service, Cahners Plaza, 1350 E. Touhy Ave., P.O. Box 5080, Des Plaines, IL 60018 (708) 635-8600
 Electronic Business can be purchased on 35mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, MI 48106

INSIDE BUSINESS

Protecting your company's biggest assets: Its ideas

When Ralph Waldo Emerson observed that the world would beat a path to the door of the innovative mousetrap inventor, he was talking about a horde of grateful customers. In today's global electronics marketplace, his dictum applies equally to the mob of competitors rushing to cash in on a good thing. Innovative ideas are among a company's most precious asset—for U.S. companies, say some, the last defensible asset. How to protect this priceless intellectual property is the subject of this issue's cover story.

From top legal and business experts, senior editor Rick Whiting has compiled a list of critical how-to's and several case histories of companies that acted effectively to identify and protect their most important ideas before entering the market. An essential step, say experts, is to understand the strengths of patent, copyright, and trade-secret protection.

Innovation is notoriously indifferent to national boundaries, so U.S. electronics executives have to think globally. To help them, contributing editor Paula Doe in Tokyo and senior editor Barbara Berkman in London examine the ways intellectual-property issues are treated abroad. It's important to know, for example, that



Senior editor
Rick Whiting

Japan is working to strengthen its intellectual-property system, extending patent coverage for software and instituting a new trade-secrets law this year. In Europe, U.S. companies have to move carefully because of the expense of filing for patents and the strict disclosure requirements.

There is widespread concern about the "dark side" of intellectual-property protection: the time and money spent in court instead of in the design laboratory. But there is a bright side as well: Protecting their best ideas forces companies to acknowledge their market value and even to promote innovation. Recognizing that their most valuable assets "walk out to the parking lot every night," many leading companies give bonuses to engineers whose ideas are innovative enough to win patents.

Other companies, however, find reasons to deliberately serve up their ideas to the competition. Case in point: Northern Telecom, which reckons to save \$50 million by the year 2000 with its non-CFC cleaning process. Contributing editor Dwight Davis reports that NT is sharing the technology with anyone at no cost. Now that's a notion a practical humanist like Emerson would really appreciate. □

ELECTRONIC BUSINESS (ISSN 0163-6197, GST Reg. #123397457) is published twice a month, except monthly in December, by The Cahners Publishing Company, A Division of Reed Publishing USA, 275 Washington Street, Newton, MA 02158-1630. Terrence M. McDermott, President/Chief Operating Officer; Frank Sibley, Executive Vice President; Jerry D. Neth, Senior Vice President/Publishing Operations; J.J. Walsh, Senior Vice President/Finance; Thomas J. Dellamaria, Senior Vice President/Production and Manufacturing; Ralph Knapp, Vice President/Human Resources. ELECTRONIC BUSINESS is a registered trademark of Reed Properties Inc., used under license. Circulation records are maintained at Cahners Publishing Company, 44 Cook Street, Denver, CO 80206-5800. Telephone: (303) 388-4511. Second-class postage paid at Denver, CO 80206-5800 and additional mailing offices. POSTMASTER: Send address corrections to ELECTRONIC BUSINESS, PO Box 173377, Denver, CO 80217-3377. ELECTRONIC BUSINESS is copyright 1992 by Reed Publishing USA. Robert L. Krakoff, President and Chief Executive Officer. Annual subscription rates for non-qualified people: USA, \$84.95; Mexico, \$124.95; Canada, \$133.70; other countries, \$149.95 per year. \$140. air mail surcharge. Subscriptions include all issues. Except for special issues where price changes are indicated, single copies are available for \$6.00 USA and \$11.00 foreign. Please address all subscription mail to Eric Schmeier, 44 Cook Street, Denver, CO 80206-5800. Cahners Publishing Company, A Division of Reed Publishing USA. Specialized Business Magazines for Building & Construction • Research • Technology • Electronics • Computing • Printing • Publishing • Health Care • Foodservice • Packaging • Environmental Engineering • Manufacturing • Entertainment • Media • Home Furnishings • Interior Design • Lodging. Specialized Consumer Magazines for Child Care • Boating • Wedding Planning.

VBPA ARP

CAPITAL SPENDING

Electronics will benefit from expected hike in capital spending

LET'S FACE IT, the recession is putting big restraints on the industry's capital spending. Despite the gloomy economy, however, 42% of electronics CFOs expect to increase their spending in 1992, while

will be the prime beneficiaries.

Hard numbers aside, personal interviews with electronics CFOs show pessimism continues. "Everyone is pulling back and all our big customers have a wait-and-see attitude now," says Randy Reed, CFO of Microfield Graphics Inc. in Beaverton, Ore. As a result, says Reed, the small designer and manufacturer of

likely to gripe about credit problems. Even the CFOs who didn't blame the banks indicated that the terms of their bank loans had worsened over the past year.

Despite the mixed outlook for 1992, the finance officers' long-term capital spending plans are overwhelmingly optimistic. Eighty percent of the CFOs believe their spending will be higher in 1996 compared with 1991. Of course, for many companies, spending has nowhere to go but up and their rosy outlook is directly tied to their optimism about their companies' revenue and profit projections. Companies in the survey spent an average of 8% of their revenue on capital equipment in 1991. By

The 1992 CFO outlook for capital spending

Change in spending (% of CFOs)	Capital spending % of revenue (avg.)
1991 vs. 1990	1991
Increase 48%	
Decrease 44	8.1%
Same 28	
1992 vs. 1991	1992
Increase 42%	
Decrease 16	8.2%
Same 42	
1996 vs. 1991	1996
Increase 79%	
Decrease 4	6.9%
Same 17	

Source: ELECTRONIC BUSINESS

only 16% expect to decrease spending. The future looks even better in the long term, based on the five-year spending plans for the 120 electronics companies surveyed last winter by ELECTRONIC BUSINESS.

For makers of electronic equipment and computers, the CFO survey provides some unexpected good news. Nine of every 10 CFOs report they'll buy factory capital equipment this year, spending 44% of their budget on such equipment. Nearly nine of 10 CFOs will spend money on office computers; and eight of 10 will approve the purchase of R&D and lab equipment. So whatever capital spending pick-up the economy sees this year, electronics companies

What they're buying

	% of CFOs	Share of budget (avg.)
Buildings	47%	13%
Office computers	86	16
Other office equip.	64	8
R&D/lab equip.	77	28
Factory capital equip.	89	44
Environmental capital equip.	37	7

Source: ELECTRONIC BUSINESS

graphic controller boards is leveling off its own spending plan this year. In fact, 42% of CFOs surveyed say their 1992 spending plans will remain unchanged from last year's levels.

According to ELECTRONIC BUSINESS's exclusive semi-annual CFO survey, 17% of companies indicate improving quality is their primary reason for making capital investments this year. Cole Pardue, vice president of finance for Tennelec/Nucleus Inc. agrees with Reed. "We're only buying equipment we feel we need right now in order to improve quality and keep us competitive," says Pardue, so vendors of electronic equipment with the potential to raise productivity, lower costs, and improve quality will continue to be winners this year.

A quarter of the finance execs surveyed blame the poor availability of credit for their capital woes, although small companies were more

Why they're buying

	% of CFOs
New product introductions	33%
Adding capacity	26
Reducing costs	17
Improve quality	17
Other reasons	7

Source: ELECTRONIC BUSINESS

1996, CFOs expect to reduce that ratio to 6.9%. Viewed this way, the long-term outlook does not bode well for U.S. competitiveness.

Of course, any five-year forecast must be taken with a grain of salt. As CFO Reed says, "You have to be a fortune teller to predict capital spending five years out."

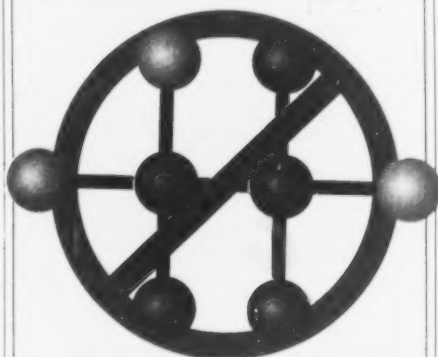
—E. B. Baatz

TECHNOLOGY

Looking for a CFC-buster? Call Northern Telecom

IF YOU'RE STILL searching for ways to reduce your dependence on CFCs used in manufacturing operations, Northern Telecom wants to help you. NT claims its CFC-elimination technology will save it \$50 million at the end of the decade, and says it has made its technology freely

Chlorofluorocarbons-buster



available to the industry.

NT's "no clean" process eliminates the cleaning phase of printed circuit board (PCB) manufacturing. CFC solvents usually remove flux, which is applied to the boards to aid in the soldering process. NT devised a spray-misting technology that coats boards with a flux mixture of just 2% solids and 98% alcohol. The soldering process boils off the alcohol-based flux, so no cleaning stage is required.

This approach, which NT has implemented in its 42 worldwide manufacturing plants, negates the need to buy and maintain cleaning equipment, purchase CFC solvents or alternatives, dispose of waste solvents, and pay higher, CFC-related taxes. "From 1988 to 1991, the program cost us about \$1 million and saved us \$4 million," estimates Art FitzGerald, NT assistant VP for environmental affairs. By weaning itself from CFCs nine years ahead of the year 2000, the deadline set by the Montreal Protocol, the Canadian communications equipment manufacturer should save more than \$50 million and prevent the atmospheric release of almost 9,000 tons of the solvents.

The biggest roadblock to widespread industry use of the no-clean technique isn't industry willingness, but U.S. military requirements, FitzGerald says. Nine CFC-alterna-

tive solvents have been approved for military-destined products, but the no-clean, no solvent approach is still under review. As a result, even commercial suppliers that do any business with the military can't yet deploy the NT method.

Even the use of the nine CFC alternatives is inhibited, says Dave Bergman, director of technology programs for the PCB industry association, the Institute for Interconnecting and Packaging Electronic Circuits. The alternatives don't have blanket approval for use with pre-existing military contracts, only future ones. To switch earlier programs from CFCs to more benign methods, electronics contractors will have to spend millions of dollars negotiating with the military on a case-by-case basis, Bergman complains.

For more information, call NT's FitzGerald at (416) 566-3048.

—Dwight Davis in Seattle

INTERNATIONAL

Germany is a bright spot in the murky ATE market

DESPITE forecasts of continued sluggishness in automated test equipment (ATE), U.S. board and chip test equipment makers could have some luck selling into Europe.

In board test, Germany is

Europe's biggest market. Sales to Germany in 1992 will amount to between \$67 million and \$73 million, vendors estimate. About half that business is in combinational test, with the rest in manufacturing-defect analysis and low-cost in-circuit test. However, because many European businesses downsized in 1991 and put their used ATE on the block, there remains a substantial gray market for ATE in Europe. GenRad estimates that in Germany alone, used ATE will account for up to \$4.6 million of 1992 sales.

Hewlett-Packard anticipates sales of its high-end IC tester will pick up in telecom test for GSM mobile phone equipment. European IC test market leader Teradyne predicts European sales will rise in 1992 because of pent-up demand. It reports early signs of improvement: Teradyne sold its first \$1.2 million VLSI test system in Europe in late 1991 to IBM in Germany.

If customer reaction is any indication, however, user interface software will be the hot item of 1992 in Europe. Siemens AG reports it ordered Westwood, Mass.-based LTX Corp. testers recently, largely because it liked the user interface. Schlumberger's user interface is "very impressive," reports Reinhard Balasus, manager of test for Fuba Communication, a \$330 million German company. Such fancy software doesn't come cheap, though, and Europeans might make do in 1992 with less costly alternatives.

—Barbara N. Berkman in London

Top IC test vendors in Europe

(1991 sales, \$ millions)

Teradyne	\$43.0
Advantest	\$32.8
Schlumberger	\$32.8
LTX	\$28.3

Source: VLSI Research Inc.

PROTECTING THE



The industry is moving from the age of manufacturing to the age of intellectual property. Here's a guide for covering your assets



DURING THE PAST few years, average gross margins at U.S. pharmaceutical companies have run 70% or higher, nearly twice the rate for semiconductor companies. Why the difference? The drug industry does a better job of protecting its intellectual property.

If profits alone isn't reason enough to protect your intellectual property, the increasingly hostile legal environment should be: While the number of patents issued in the U.S. grew by 46% between 1980 and 1990, the number

of patent-related lawsuits increased by more than 50% during the same period, according to the U.S. Patent and Trade Office. "We're moving from a manufacturing era to an intellectual-property era," says Ron Collett, an attorney and Dataquest analyst.

Still, only a relative handful of U.S. electronics companies—led by Texas Instruments, Hewlett-Packard, and Mentor Graphics—have adopted systems for identifying, defending, and wringing the most from their intellectual property. In general, the systems boil down

to a few key strategies:

- Routinely identify technologies that require protection. That means designating a patent liaison officer to oversee the process and creating a patent committee to screen potentially important intellectual property;
- Protect intellectual property with patents, copyrights, or other formal means, or designate critical expertise as trade secrets;
- Educate engineers and other employees on the importance of intellectual property. Provide incentives to encourage engineers to flag their innovations for protection;
- Build a patent portfolio that can be used to protect against infringements on intellectual property, as a defense against lawsuits from other companies, and for bargaining power in cross-licensing deals.

POWER OF THE IDEA

SEVERAL COMPANIES have established patent committees, often made up of attorneys and engineers, that periodically review the company's technology, products, and designs. At HP, the first step is to annually survey company managers about strategic emerging technologies for the company and the industry. Using the survey results as a benchmark, engineering managers designated as "patent coordinators" review the latest innovations within their departments and smoke out what should be protected.

One problem facing such companies is teaching engineers about the subject. "Many engineers think that it has to be a splash of genius to be patentable," says Jerry W. Mills, an attorney with the Baker & Botts law firm in Dallas and chairman of the firm's Intellectual

By Rick Whiting

Property Group. Even incremental improvements often merit patent protection, he says. Adds Frank S. Delia, vice president and chief legal and administrative officer at Mentor Graphics, "We make sure engineers look early in the development cycle to see if we have some [innovation] worth patenting."

To encourage engineers to identify ideas and technology that might be worth protecting, Advanced Micro Devices Inc. (AMD) awards bonuses to engineers of \$1,500 or more for successful patent applications. HP's

Stephen Fox, associate general counsel and intellectual property director, advises engineers: "When in doubt, report it."

One example of how easily intellectual property can be overlooked occurred at John Fluke Manufacturing Co. in 1981. In a casual conversation with a Fluke engineer, then-corporate attorney Mikio Ishimaru learned of a digital multimeter the company had been selling for 11 months. The engineer had devised an analog-to-digital converter chip for the product that simultaneously handled fast and slow signals, a feat the engineer considered routine. Ishimaru, now director of technology law and associate general counsel at AMD, moved quickly to patent the device. When a Japanese company began marketing a copy of the multimeter a year later, Fluke mounted a successful court challenge.

Intellectual-property protection can also be stymied by the industry's rapid technology cycle and short product lifespans. Why patent an invention, some ask, when the product will be outdated in 18 months—long before a patent can be awarded?

Anyone who believes that the rapid technology cycle precludes the need to protect intellectual property "has their heads in the sand," says Jerry Rogers, president and CEO of Cyrix Corp. in Richardson, Tex. Companies that fail to protect



Mentor Graphics pushes its engineers to look hard for patentable innovations, says vice president Frank S. Delia

their core technologies all but encourage competitors to build follow-on products without copying the original. And if the competitors patent *those* products, a company could be locked out of a market it pioneered.

AMD, in fact, found itself in just such a fix because of a lawsuit brought by Brooktree Corp., a San Diego designer of graphics and imaging chips. At the time that AMD invented a bipolar "color palette" chip in the early 1980s, says Ishimaru, the company was using patents to cover broad technology areas rather than specific

semiconductors. Brooktree later developed, and patented, a CMOS color palette chip. When AMD came out with a CMOS implementation of its chip, Brooktree sued for infringement and won a \$25 million judgment against AMD in 1990. The case remains on appeal.

ELECTRONICS companies face another special intellectual-property problem: Most company secrets are carried around in the heads of employees. The relatively high rate of job-hopping within the industry exacerbates the problem. Attorney Tim Covington of Palo Alto's Wilson, Sonsini, Goodrich, Rosati recommends that new employees be made to sign confidentiality agreements in which they promise not to disclose trade secrets and not to obtain other companies' trade secrets, the latter for use in the event the company is charged with illegally obtaining insider information.

Seagate Technology is learning a painful lesson in such a case. IBM sued Seagate last October because the disk drive company hired away the manager of IBM's magnetoresistive (MR) head design program. The suit charges that the manager was hired to help Seagate create products using the MR technology that IBM considers a trade secret. Last month a federal judge slapped Seagate with a preliminary injunction.

Japanese companies capture the top spots

U.S. patents issued in electronics and instrumentation in 1991

1	Toshiba	895
2	Hitachi	869
3	Mitsubishi	793
4	Motorola	572
5	IBM	563

Source: MicroPatent

COVER STORY

tion prohibiting the company from using or disclosing the MR technology pending trial. In such situations, patents are one of "the best ways to make sure the technology stays with the company," says attorney Mills.

Similarly, a thick patent portfolio is the best means of protecting a company against infringement charges. "Intellectual property as a defensive weapon is extremely high on our list of priorities," says Cyrix's Rogers. Cyrix and its math co-processor chip have been the target of patent infringement lawsuits brought by Intel Corp.

The bitter patent dispute between Motorola

U.S. and Japan aggressively protect their chip designs

Registrations under Semiconductor Chip Protection Act of 1984

	1985-87	1988	1989	1990	Total
U.S.	1,920	530	530	309	3,289
Japan	1,151	453	585	759	2,948
Other countries	173	64	47	25	309
Total	3,244	1,047	1,162	1,093	6,546

Source: U.S. Copyright Office

Inc. and Hitachi Ltd. in 1990 is a case in point. Motorola had charged that Hitachi's H8 and H16 microprocessors violated patents held by the U.S. company. But Motorola received a shock when Hitachi countersued, claiming that Motorola's cash-cow 68030 microprocessor violated one of its patents. Hitachi's patent, which

Weapons for the intellectual-property wars

DECIDING HOW to protect intellectual property—whether via patents, copyrights, trade secrets, mask-work rights, or trademarks—can be as important as deciding what to protect. Determining which is best "can be a fundamental decision for a company," says Tim Covington, an attorney with the high-tech law firm Wilson, Sonsini, Goodrich, Rosati in Palo Alto, Calif.

Patents, the strongest form of legal protection, grant an exclusive monopoly for 17 years by protecting ideas, designs, and inventions against copying and infringement—even if done unwittingly. The U.S. Patent and Trademark Office grants patents on the basis of three criteria: Is the invention or design new or novel? Is it useful? Is it "non-obvious to a person of ordinary skill in the art?"

A major change in the federal court system 10 years ago offers reason enough to seek patent protection. Before then, patent lawsuits were tried in federal district courts and as many as 70% of all patent challenges were successful. But in 1982, Congress created the U.S. Court of Appeals for the Federal Circuit in Washington, D.C., specifically to hear patent cases. Today the numbers are reversed—patents are upheld in two out of three cases.

Copyrights are narrower in scope than patents and guard only against someone

copying specific material, not the ideas it contains. Although they can be recorded with the U.S. Copyright Office in Washington, copyrights apply automatically to any original work "as soon as you put down your pen or shut off your computer," says a copyright office spokesman.

Trade secrets have the advantage of having no time limit. (Patents expire after 17 years.) One example is Coca-Cola's decision to keep its syrup formula a trade secret rather than patent it. Had Coke patented its recipe years ago, it would no longer be a secret. Although trade secrets are not legally protected, lawsuits alleging trade-secret infringement can succeed if a judge or jury is convinced that the intellectual-property owner took every step possible to guard against disclosure.

Another weapon available to chip makers is the Semiconductor Chip Protection Act of 1984, which protects a semiconductor's design or mask work for up to 10 years. Mask work is eligible for protection when it becomes fixed in a semiconductor and is registered with the U.S. Copyright Office or "is commercially exploited." Although the law was passed to prevent foreign companies from copying chips made by U.S. companies, the Brooktree/Advanced Micro Devices suit is so far the only case brought to trial under the statute. □

covered access methodology to on-chip memory, allowed the Japanese company to launch a counter-offensive. The issue was settled out of court when a federal court judge threatened to halt sales of chips by both companies.

Such thinking, for better or worse, is creating a patent arms race within the industry, says a chip company executive who requests

anonymity. "Everyone is building up their patent portfolios, like the U.S. and the Soviet Union did with missiles during the Cold War."

As a way of avoiding costly lawsuits, some companies are turning to cross-licensing, in which they make their intellectual property available to each other. Covington says the technique works best between companies that

Software: Intellectual property's new frontier

SOFTWARE DEVELOPERS generally lag other segments of the electronics industry in establishing programs to protect their intellectual property. "Software companies are going to have to start paying attention," warns Jerry W. Mills, an attorney with the Baker & Botts law firm in Dallas.

Not every company has been lax. In a corporate memo leaked to the press last May, Microsoft Corp. chairman Bill Gates expressed amazement at his company's failure to take advantage of the patent system. He exhorted his managers to "patent as much as we can" and explore patent cross-licensing deals with other large companies.

The generally low level of awareness is surprising given the ease with which software can be copied when compared with the equipment and expertise needed to knock off, say, a semiconductor. "We are the most exposed industry in the world," says Ken Wasch, director of the Software Publishers Association in Washington, D.C., which has been vigorously fighting software piracy.

Part of the problem is cultural. Software developers are free spirits, artists who often view patents as restrictions on their creativity. And keeping intellectual property in-house is particularly difficult in the software industry because programmers change jobs frequently and, deep down, consider their work to belong to them rather than to their employer.

Adding to the problem has been the murky question of just how intellectual-property protection laws apply to software. It was not until 1980 that U.S. copyright law was amended to specifically include software, although the U.S. Copyright Office has accepted copyright registration for software since 1964.

While software companies in the past re-

lied on copyrights for protection, more and more now seek patent protection as well. A copyright covers the code or instructions for a pull-down menu, for example, while a patent protects the concept of a pull-down menu itself.

Copyrights make illegal the kind of outright copying practiced by software pirates. But just as engineers have become adept at reverse-engineering semiconductors, developers are becoming more experienced at reverse-engineering software code and writing their own software that performs the same tasks without infringing copyrights, according to Tim Covington, an attorney with the law firm Wilson, Sonsini, Goodrich, Rosati in Palo Alto, Calif. He suggests that developers protect their software with both a copyright and either a patent or trade secret.

In addition to relying on copyrights to protect the source and object code underlying its products, Mentor Graphics considers its code to be a trade secret and contractually binds customers who are given access to the code to keep it confidential.

Several events this year are expected to help clarify just where software stands concerning intellectual-property protection laws. Imminent is a report from the Office of Technology Assessment that will explore the issue of whether the "look and feel" of computer software can be protected under existing laws. A Special Advisory Commission on Patent Law Reform is expected to propose new rules for software protection in a report due in August. Observers add that the pending Apple Computer Inc. lawsuit, charging Microsoft Corp. and Hewlett-Packard Co. with infringing its Macintosh graphical user interface, will go a long way toward determining how broadly intellectual-property laws can be applied to computer programs. □

have complementary technologies but sell into different market niches. Mentor's Delia, for example, tells of a suit brought against the company by competitor Valid Logic Systems Inc. in 1985. Each held a patent for a hardware modeler suite of software and Valid claimed Mentor was infringing its patent. Delia says there were slight differences in the two patents and the two companies resolved the dispute by cross-licensing their technologies.

That, of course, fuels the argument for patenting as much technology as possible. "Having a substantial patent portfolio is a significant part of being successful in cross-licensing," says HP's Fox. His company has between 1,800 and 2,000 patents with an undisclosed number pending. Fujitsu Ltd. claims that by using as bargaining chips its portfolio of semiconductor patents—more than 1,000 in the U.S. and 3,000 in Japan—the company was able to negotiate a cross-licensing pact with TI last year that resulted in "substantially lower royalty payments than Fujitsu has paid in the past," according to a company statement.

But cross-licensing can backfire. Covington says that the licensor must spell out how the licensed technology can be used, whether the licensee has the right to improve on the patented material, and if so, who owns rights to the improvements. "Failure to ask and answer those questions can result in strategic relations that, in time, lead to the demise of the licensor," he says. The problem is particularly acute when U.S. companies license technology to Japanese manufacturers, which improve the technology, patent the improvements, and close the licensor out of its own market.

THEN THERE'S WHAT some call the dark side of intellectual property—the use of patents and other protected material as competitive weapons or revenue generators. TI has come under fire for its aggressive attempts to collect—some say "extort"—royalties based on its portfolio of more than 5000 patents. TI has received some \$800 million in royalties for its patents since 1986. "Just as no one should



Careless cross-licensing can lock a company out of its own market, warns attorney Tim Covington

Linda Sue Scott

expect to get our products or our services for free, no one should get our inventions for free," argues Dick Agnich, senior vice president and general counsel at TI.

AT&T, meanwhile, is suing chip maker Integrated Device Technology Inc. (IDT) of Santa Clara, Calif., for royalties on a half dozen patents relating to semiconductor production. Part of the suit claims that AT&T is owed royalties on IDT semiconductors because those chips are manufactured using Applied Materials Inc. equipment, which in turn uses an AT&T-pat-

ented clamp to hold silicon wafers, says Jack Menache, IDT vice president and general counsel.

MENACHE WORRIES THAT companies such as TI and AT&T are demanding royalties far out of proportion to the contribution their technologies make to the final product. Menache also points to TI's earlier attempts to wring what he calls "unreasonable royalties" from several chip makers for its patented concept of encasing semiconductors in 25-cents worth of plastic packaging. Other sources estimate the size of the royalties sought by TI and AT&T at about 3%.

Unclear is just what this means in terms of fostering or hindering the electronics industry's innovative abilities. Proponents of an aggressive intellectual-property protection approach argue that safeguards are needed to guarantee a profitable return on innovation. Without intellectual property protection, according to AMD's Ishimaru, "I suspect you would have no improvements at all." Others argue that taking intellectual-property protection to the extreme hinders innovation, particularly among small cash-strapped companies.

All this angers Cyrix's Rogers, who argues that intellectual-property laws were meant to encourage innovation and so benefit society; offensive uses of patents and copyrights circumvent that intent. He vows not to play the game. "We're just going to out-innovate our competitors," he says. □

A global guide to

PATENTS

INTELLECTUAL
PROPERTY

Going for a Japanese patent? Plan ahead

By Paula Doe



Quick, name the country featured on a provocative public broadcast-ing special a few months ago that targets foreigners with its unfair patent system. If you guessed Japan, guess again. It's the United States, according to Japanese government-owned NHK Television Network's "America's Patent Strategy—Targeting Japanese Business," which aired in Tokyo in November.

The program presented Japanese companies as being hounded by U.S. infringement suits and noted the disturbing U.S. emphasis on the broad protection of original ideas. The narrator noted that the U.S. would judge an invention as an infringement if its basic idea were the same as someone else's—even if the method or mechanism were different.

That pretty well sums up the difference between the Japanese and

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U.S. patent system favors the "little guy"

By Rick Whiting



The U.S. patent system is singularly American: It emphasizes protection of individuals' rights, but it also makes litigation hard to avoid.

Unlike nearly every other country, which awards patents to the first to file an application, patents in the U.S. are granted to whomever came up with the invention, innovation, or idea first. The upside of that system is that the rights of the pro-

verbial "little guy" are preserved.

The downside is that the U.S. approach can mean lengthy court battles over the question of who invented what first. "It's probably the fairest, but probably the most difficult to enforce," says Mikio Ishimaru, director of technology law and associate general counsel at Advanced Micro Devices Inc. in Sunnyvale, Calif., of the U.S. patent system.

As with the post office, it has be-

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Europe offers a variety of patent options

By Barbara N. Berkman



A U.S. company has several options for securing a patent in Europe. All of them are expensive—typically more than \$10,000 in up-front costs—and the type of protection varies from one to another.

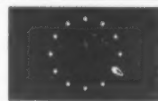
For now, there is no such thing as a European Community patent, and progress toward the one outlined by the European Patent Convention (EPC) of 1975 has been slow.

Moreover, intellectual property rights are largely exempt from the open-market provisions of the harmonized European market; a French patent, for example, is not recognized in Germany or Britain.

Whichever method you choose to secure a European patent, you must consider how the process could be affected by intellectual-property laws—not only in Europe, but elsewhere in the world. While the U.S.

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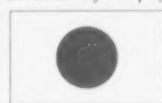
International patent rules at a glance



	United States	European Union	Japan
Length of process	18-24 months average	44 months average (European Patent Office)	4 to 6 years
Cost of process	\$5,000-\$15,000	\$10,000 and up plus translation costs	\$8,000 to \$15,000 initial costs; more when problems occur
Renewal fees	\$900 (3 1/2 years) \$1,810 (7 1/2 years) \$2,730 (11 1/2 years)	Annual fees differ between countries	Annual fees range from \$100 in first year to \$4,000 by 20th year
Grace period between disclosure and filing dates	1 year	Six months (limited)	Six months (limited)
Length of protection	17 years	20 years from filing date	15 years from application publication; 20 years from application date
Criterion for patent award	First to invent	First to file	First to file
Publication of innovation	When patent is awarded	18 months after filing application	18 months after filing application
Challenges to patent	Litigation after patent is awarded	Within 9 months after patent is awarded	Competitors may file opposition to delay patent
Other forms of protection	Copyrights, trademarks, semiconductor mask work	Copyrights, trademarks	Copyrights, trademarks, new trade-secret and service-mark registration laws
Strength of patent system	Emphasizes protecting the "little guy"	EPO offers single application point for 15 countries	More thorough process; disseminates technology throughout society
Weakness of patent system	Encourages litigation	EPO rejection eliminates option of filing application in individual countries	Slow approval process; big companies have an advantage
Breadth of interpretation	Broad interpretations of original ideas	Scope of patentable subject matter is somewhat limited	Scope of patentable subject matter is somewhat limited
Modification options	Applications can be amended; patent cannot be changed once issued	Applications cannot be amended; patent scope can be narrowed after patent issue	Separate patents are granted for improvements and invention variations
Notes on reciprocity	U.S., Japanese, and European patents are not reciprocal. But all major countries observe such international treaties as the Patent Cooperation Treaty, which recognizes the initial filing date in one country as binding in others if later applications are filed within one year.		

Source: ELECTRONIC BUSINESS, Electronic Trend Publications

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U.S. intellectual property systems. In Japan, the goal of the system is

not to protect the individual inventor, but to spread technology.

The result is what some U.S. companies might regard as a disturbingly narrow interpretation of intellectual property claims; if a company patents a bicycle, for instance, another could patent one with a basket, or a different seat. The rules of interpretation apply to all companies doing business in Japan, not just foreigners, according to Shigeru Miki, a patent lawyer at Miki Law and Patent Office in Tokyo. "Japanese companies aren't happy either," he says.

CHANGES ARE IN the works—Japanese patents are being extended to cover software, for example, and this April a new trade-secrets law will bring Japan in line with other developed countries. Still, the Japanese system will generally afford less protection than the U.S. system. When Fusion Systems Corp. in Rockville, Md., patented a high-intensity microwave lamp, their competitor Mitsubishi Electric Co. filed for patents on a similar lamp of a different shape, as well as on the clamp that holds the system together, along with approximately 300 other related patents, making it difficult for Fusion to sell its lamp without licensing Mitsubishi technology.

As in some European countries, moreover, applications in Japan are published years before patents are granted. Separate patents are granted for improvements and variations on an invention. That means a company can head off a competitor's patent by "cluster filing" its own related patents. "When Toshiba sees NEC filing something, they could say 'That's basically what we're doing' and file their own patent," explains David Livdahl, partner at Graham & James in Tokyo. "So when NEC is issued a patent,

Toshiba will be close to getting one, too." As a result, the two companies will have to cross-license each other's technologies.

Such problems can be minimized by careful preparation of the patent application. Don't file a direct translation of the U.S. application in Japan—get it rewritten by someone who knows the Japanese system. At the very least, have the translated Japanese applications translated by someone else back into English for checking. And watch the Official Patent Gazette to see who's filing related patents so you can oppose them before they limit the usefulness of your patent.

U.S. companies also complain that once the application is published, it seems to take forever to get a Japanese patent—normally four, five, or even six years. The extended process does serve to weed out invalid claims during application instead of with litigation afterwards, but competitors have access to the technology the entire time. More than 500,000 applications a year are reviewed by about 900 Patent Office examiners—half as many as in the U.S., which processes one-quarter as many applications. Delays are longer in areas where many patents are filed, such as electronics. Computer-related patents in Japan ballooned to 20,000 in 1990, nearly 8% of all patents granted.

Patents can also be delayed by opposition filed by competitors, which also tends to screen out invalid claims. In practice, only a small percentage of patent applications are opposed, but major applications can be delayed by floods of oppositions, all of which must be translated and responded to individually.

The Japanese are making some strides toward speeding up the system by adding more examiners and a new computerized filing system. They are also subcontracting some of the application processing and urging Japanese companies to file fewer patents. There is a fast-track examination system if competitors are close to closing in on an inven-

tion. From the Japanese government's point of view, however, the fact that delays allow more companies to use a technology is not a big problem, so progress in improving the process can be painfully slow.

Another big change taking effect in April is a new trade-secrets law that brings Japan up to standards of other developed nations. It remains to be seen exactly what this will mean. "No one knows what the law will do," notes Livdahl of Graham and James. "But I'm sure it will somehow be applied in a very Japanese way and end up very different from the U.S." □

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come fashionable to bash the U.S. Patent and Trade-

mark Office for slowness. But most corporate attorneys that deal with the PTO on a regular basis say that the department's performance has improved in recent years, and that patent applications that once took three to four years to process are now turned around in 18 to 24 months.

The PTO is not without its critics, however. Ron Collett, an attorney and Dataquest analyst, says the electronics industry is ill-served by the U.S. patent system. Even 18 to 24 months to process a patent application is too long for an industry known for its short product lifespans, he says.

Estimates of the costs of applying for a patent in the U.S. range from \$5,000 to \$15,000. The initial filing fee is \$690, and there is an issue fee of \$1,130 if the patent is approved. Patents are good for 17 years but must be renewed after three and one-half, seven and one-half, and 11 and one-half years for fees of \$900, \$1,810, and \$2,730, respectively. All fees are reduced by 50% for companies with 500 or fewer employees, individual inventors, and nonprofit organizations.

Warning: If any information about a company's new technology or innovation is disclosed before patent ap-

plication, the invention may be considered "in the public domain" and the right to protection lost. As a result, executives, engineers, and other employees must be careful about what they reveal in speeches, papers, and other public forums.

That can make timing a critical issue, since patent applications in other parts of the world are made public after a certain amount of time. In Europe, for example, that occurs 18 months after filing an application. If that happens before a U.S. patent application is filed, protection in the U.S. can be lost. Applications in the U.S. are kept confidential until the patent is awarded. If the application is turned down, the information is never disclosed.

ANOTHER QUIRK in the U.S. system: Working models of inventions are no longer required, and patents can be awarded based on a plan or design. That also favors the individual inventor and makes answering the all-important question "who was first?" even more difficult.

Copyrights are automatic for written material and software, although they can be formally registered with the U.S. Copyright Office (part of the U.S. Library of Congress) for a \$20 filing fee. Protection for semiconductor mask work under the Semiconductor Chip Protection Act of 1984 is also obtained through the Copyright Office. ☐

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grants priority to the first to invent the product, for example, Europe and Japan recognize the first to file an application.

Note also that, while Europe does not recognize U.S. patents, the date on which you apply for a U.S. patent is recognized in Europe as the official filing date (the "priority date") for the purposes of intellectual-property protection, as long as an application for a European patent is filed within one year.

Another important caveat is that you must not disclose anything about your invention, *anywhere in the world*, before you apply in Europe. If you first apply for a U.S. patent, or if you first discuss your innovation at any conference, seminar, or in a publication, you've had it," warns European patent attorney Robert Naismith, a partner with Chartered Patent Agents Cruikshank & Fairweather in Glasgow.

Because of the high cost, get an assessment of your invention from a European Patent Attorney who is authorized to act before the European Patent Office (EPO), or from a Chartered Attorney in the U.K. The initial assessment usually is free. After such a consultation, the cost often dissuades U.S. companies from proceeding, says Naismith. To save money, companies may alternatively decide to protect themselves only in their major European markets. In any case, get a reputable patent attorney who can describe the invention concisely to minimize translation costs.

THE CONFUSION COMES in deciding which intellectual-property option to choose. Each has its advantages and drawbacks.

The Munich-based EPO, the closest thing to "one-stop shopping" for patents, issues a single European patent that is registered in up to 15 of the member countries of the European Patent Convention. The application is usually filed within a year of filing in the U.S., and the initial examination and search is conducted by the EPO.

The key advantage, of course, is the multinational protection. Be warned, though, that the patent offices of the signatory nations may not interpret or enforce the patent in a consistent way. British and German courts disagreed on a recent consumer-electronics infringement case, for example.

Remember that an EPO patent puts all your eggs in one basket. If the EPO rejects the patent, you can't try again later at any of the

national patent offices in the same countries.

European patents also are available in accordance with the 49-country Patent Cooperation Treaty, or Euro-PCT. Following an international search, your application goes through an international preliminary examination. You must file regional or national patent applications (at the EPO, for example, or the U.S. or Japanese patent office) in the nations you specify; those agencies then decide whether to grant the patent.

ONE OF THE ADVANTAGES here is the 30-month "international phase" period between the initial U.S. filing date and the deadline for entering the European phase. This delay means that you defer payouts of European filing fees and national phase filing fees, which are a huge chunk of the application costs, until you have an assessment of the invention's patentability. The main disadvantage is that the Euro-PCT route, like an EPO patent, costs roughly \$10,000 just to get your application filed. Later, translation fees can run several thousands of dollars if the specification is lengthy.

If you want protection in just three or fewer countries, it may be better to go directly to the national patent offices. That saves money in translation and filing fees. (A translation of up to 35 pages costs about \$565 per language.)

The disadvantage, however, is that you commit to filing fees without having a search or examination first carried out by the U.S. Patent and Trade Office, a step that often allows you to gauge if you should file overseas. Lacking protection elsewhere in Europe, "you leave yourself open to parallel importation, and it is likely that someone else will start manufacturing in that country," says Morag Macdonald, a partner at London law firm Bird & Bird. "If you have a broad market, make sure that you designate all the countries." ☐